

**TRENT UNIVERSITY**  
**FACULTY OF ARTS AND SCIENCE**  
Final Examinations 1998/99  
**MATHEMATICS-STATISTICS 150**

**PART A** Time: 30 Minutes

No aids allowed

Each question is worth 2 marks

For each question, circle the letter [ a), b), c) etc.] corresponding to the correct answer.

1. The categories in a Pareto diagram are ordered
  - a) alphabetically
  - b) from least frequent to most frequent
  - c) from most frequent to least frequent
2. The median of a particular set of 117 data values will be the same value whether the set of data is considered to be a population or a sample.
  - a) true
  - b) false
3. The mean used in determining the mean rate of change for compound interest is a(n)
  - a) arithmetic mean
  - b) geometric mean
  - c) weighted mean
4. When prices in U.S. dollars are converted to prices in Canadian dollars, the data are changed by a
  - a) linear transformation
  - b) relocation
  - c) rescaling
  - d) a) and b)
  - e) a) and c)
5. To compare proportional splits across political parties for samples from three communities, we use a
  - a) comparison rose diagram
  - b) cross-tabulation display
  - c) multiple box-and-whisker plot
6. Polynomial regression involves fitting a curve to  $x,y$  pairs with an appropriate use of
  - a) multiple correlation
  - b) multiple regression
  - c) rescaling data
7. If  $CD$  is the current dollar value of an item,  $RD$  is the real dollar value of the item for the same time,  $CPI[B]$  is the CPI for the base period and  $CPI[C]$  is the CPI for the current period, then
  - a)  $RD = CD \times (CPI[B]/CPI[C])$
  - b)  $RD = 100 \times CD \times (CPI[C]/CPI[B])$
  - c)  $RD = CD / CPI[C]$
8. An aggregate index number is
  - a) a weighted mean
  - b) a geometric mean
  - c) based on a weighted mean
  - d) determined from weighted totals
9. If  $A$  and  $B$  and  $C$  are mutually exclusive, then  $P[A \text{ or } B \text{ or } C]$  is equal to
  - a) 0
  - b)  $P[A] + P[B] + P[C]$
  - c)  $P[A] \times P[B] \times P[C]$
  - d) 1

10. In order to find the number of possible samples of 50 members taken without replacement from a population of 300 members, it is appropriate to use
- combinations
  - permutations
  - the multiplication rule for independent trials
11. If we choose 8 students at random from a full group of 33 majors of whom 18 are single majors and 15 are joint majors, then, to find the probability that the sample includes 5 single majors, we use
- binomial probability
  - hypergeometric probability
  - Poisson probability
12. An unbiased estimator for a parameter
- is always equal to the parameter
  - is always close to the parameter
  - is equal to the parameter “on the average”
  - may never equal the parameter
  - c) and d)
13. Using prior information that a population success proportion differs from 0.5 by at least some specified amount will reduce the minimum sample size needed to achieve a required probability of having an estimation error that does not exceed a given bound
- for finite or infinite populations
  - only for finite populations
  - only for infinite populations
14. In a statistical hypothesis test, a type II error is the
- acceptance of a false null hypothesis
  - level of significance
  - rejection of a true null hypothesis
15. If a 95% two-sided confidence interval for a mean  $\mu$  is calculated as 2.3 to 2.6, then, in the test of  $H_0: \mu = 2.0$  vs  $H_A: \mu \neq 2.0$  with a 5% level of significance, we should
- accept  $H_0$
  - reject  $H_0$
  - reserve judgement
16. To test the null hypothesis that the *variances* of two normal populations are equal, we test the null hypothesis that
- their difference is 0
  - their ratio is 1
17. If a computer printout produces a test statistic  $\chi^2$  with a two-sided  $P$ -value of 0.0634, and if the printout is to be used in a statistical hypothesis test with a two-sided alternative and with  $\chi^2$  as the appropriate test statistic and with level of significance  $\alpha = 0.05$ , then the null hypothesis should
- be rejected
  - not be rejected
18. Analysis of variance is used to test the possible equality of several population
- means
  - proportions
  - standard deviations
  - variances